

REMARKS

Reconsideration of this application is respectfully requested. The election of claims 1-16 and 21, as reflected in the above listing of claims, is confirmed.

The rejections of claims 1-16 and 21 under 35 USC 103 as being unpatentable over van Os, US 5,792,272, in view of Murugesh, US 6,450,117, should be withdrawn. The present claims recite features neither taught nor suggested by these references, whether considered alone or in combination. Hence, the claims are patentable over these references.

With respect to claim 1 and its dependent claims, the recited feature of a cleaning gas distribution channel separate from the processing gas shower is not found in the cited references. The Office Action refers to gas injection manifold 15 in the apparatus described by van Os (col. 4, ll. 18-31), however, it is apparent from van Os' description that this same gas manifold is used as a processing gas delivery mechanism. See, e.g., col. 3, ll. 39-40: "The first manifold 15 conveys at least one gaseous chemical to plasma chamber 18." The same is true for gas manifold 17 (see, e.g., col. 4, ll. 4-7). Hence, because both of these gas delivery mechanisms are used to convey process gasses as well as cleaning gasses, neither can be said to be "separate" from the processing gas shower as recited in claim 1. Instead, gas manifolds 15 and 17 of van Os are both processing and cleaning gas delivery mechanisms. For at least these reasons claim 1 and its dependent claims are patentable over van Os.

With respect to claim 11 and its dependent claims, the recited feature of cleaning gas injection ports distributed around the chemical vapor deposition chamber lid and configured to deliver a greater concentration of the reactive cleaning gas to an upper region of the chemical vapor deposition chamber than to a lower region of the chemical vapor deposition chamber is not found in the cited references. Contrary to the conclusion set forth in the office action, this claimed feature is not a recitation of a field of use. Instead, it is a precise description of a mechanical configuration of the cleaning gas injection ports of the present invention. This claim language does not merely discuss how or where the gas injection ports may be used (hallmarks of a field of use limitation), but instead describe attributes of the orientation and operation of those ports which differentiate them from the gas injection ports described by van Os.

For example, the gas injection ports described by van Os with reference to Figure 4 are oriented so as to direct cleaning (and/or process) gasses downwards into the processing chamber 16 (see, e.g., col. 4, ll. 10-13: “The nozzle structure 70 has a plurality of nozzles 44a and 44b coupled to the plenum and configured for injecting the gaseous substance from the plenum to the chamber.”). It is interesting to note that van Os chose similar language to that found in the present claims when describing how these gas nozzles were oriented, i.e., “configured to . . .”. This is further evidence that persons conversant in the relevant art would understand the language of the present claims to define true mechanical features rather than just filed of use limitations.

Importantly, the nozzles described by van Os are configured to direct gasses towards only the lower portion of the processing chamber and not towards the upper part thereof. Consequently, these nozzles cannot be said to be configured to deliver a greater concentration of the reactive cleaning gas to an upper region of the chemical vapor deposition chamber than to a lower region of the chemical vapor deposition chamber as recited in claim 11. For at least this reason claim 11 and its dependent claims are patentable over van Os.

Similar logic holds true with respect to the patentability of claim 21, which recites “means for generating a desired concentration gradient of the reactive cleaning gas in the chemical vapor deposition chamber, the desired concentration gradient including a greater concentration near cooler elements within the chemical vapor deposition chamber than near warmer elements”. The nozzles described by van Os are indiscriminately oriented downwards and towards the interior of the processing chamber 16. There is no teaching or suggestion that these nozzles are somehow oriented so as to produce a cleaning gas gradient as recited in the claim. The portion of the reference cited in the Office Action makes no mention whatsoever of such a gas gradient and so there is nothing to support the conclusion that such a feature is taught by van Os. For at least these reasons claim 21 is patentable over van Os.

The remaining reference, Murugesh, is cited for teaching a “cleaning gas source”. Whether or not such a teaching is provided, it does not alter the conclusions of patentability set forth above. For example, even if such a cleaning gas source were added to the system

described by van Os, that system would still lack all of the patentable features discussed with reference to claims 1, 11 and 21, respectively. Consequently, all of the present claims are patentable over the combination of van Os and Murugesh for at least the reasons discussed above.

If there are any additional fees due in connection with this communication, please charge Deposit Account No. 19-3140.

Respectfully submitted,
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